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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application of

Applicants	: Jeffrey A. Sturgill et al.
Serial No.	: 10/038,150
Filed	: January 4, 2002
Title	: NON-TOXIC CORROSION-PROTECTION RINSES AND SEALS BASED ON COBALT
Docket	: UVD 0299 PA
Examiner	: Scott R. Kastler
Art Unit	: 1742
Confirm. No.	: 7448

CERTIFICATE OF MAILING
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on August 29, 2006.

R. A. Killworth 26397
Richard A. Killworth Reg. No. 26,397

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

BRIEF ON APPEAL

This is an appeal from the Office Action mailed April 4, 2006, finally rejecting and/or objecting to claims 1, 3-53 and 123-126, all of the claims in the application. A Notice of Appeal was timely mailed on June 29, 2006, with the accompanying fee. Our check in the amount of $250.00 accompanies this Brief in accordance with 37 CFR §41.20(b)(2).

Real Party in Interest

The real party in interest in this application is the University of Dayton, by an assignment from the named inventors recorded in the files of the U.S. Patent and Trademark Office on February 22, 2002 under Reel/Frame 012629/0295.

Related Appeals and Interferences

Applicants know of no currently pending related appeals or interferences that would have an effect on the outcome of this appeal.

Status of Claims

Claims 1, 3-53 and 123-126 remain in this application. Claims 2, and 54-122 were canceled. Claims 1, 3-10, 12-31, 33, 35-53, and 123-126 stand rejected. Claims 11, 32, and 34 are objected to. Accordingly, claims 1, 3-10, 12-31, 33, 35-53, and 123-126 are before this Board for consideration on appeal. A copy of the appealed claims is found in the Appendix attached to this brief.

Status of Amendments

The claims were not amended after final rejection.

Summary of Claimed Subject Matter

Applicants' invention is directed to a solid corrosion-inhibiting seal. The corrosion-inhibiting seal is formed on a coating selected from anodic coatings, phosphating coatings, or black oxide coatings. P. 6, lines 9 to p. 7, line 2; p. 14, lines 25-28; and Table 1. The solid corrosion-inhibiting seal comprises cobalt, wherein the cobalt is trivalent cobalt, tetravalent cobalt, or combinations thereof, and a valence stabilizer combined to form a cobalt/valence stabilizer complex within the solid corrosion-inhibiting seal. P. 9, line 21 to p. 13, line 8; p. 15, line 17 to p. 26, line 19. The cobalt/valence stabilizer complex has a solubility in water of between about 5×10^{-1} and about 1×10^{-5} moles per liter of cobalt at about 25°C and about 760 Torr or is sparingly soluble. P. 10, line 21 to p. 11, line 11; p. 12, lines 9-22; p. 16, line 16 to p. 18, line 3. The valence stabilizers can be organic or inorganic. P. 23, line 19 to p. 26, line 19; p. 150, line 14 to p. 152, line 13; p. 325, line 31 to p. 326, line 24; with Tables 2-3, and p. 66-149, and 211-325 providing examples. The corrosion-inhibiting seal can include a cationic or anionic solubility control agent. P. 331, line 16 to p. 337, line 29. The corrosion-inhibiting seal can include a lubricity agent. P. 337, line 31 to p. 338, line 8. The corrosion-inhibiting seal can be colored and can include agents which improve the color-fastness. P. 338, line 10 to p. 339, line 12.

Grounds of Rejection to be Reviewed on Appeal

The grounds of rejection for review on appeal are:

(1) Claims 1, 3-10, 12-31, 33, 35-43 and 123-126 stand rejected under 35 USC 102(b) as being anticipated by Japanese patents 77 06 258, 76 42 057, 74 34 929 and 74 14 621.

(2) Claims 44-53 stand rejected under 35 USC 103(a) as being unpatentable over Japanese patents 77 06 258, 76 42 057, 74 34 929 and 74 14 621 in view of Ouyang et al (US 5,505,792).

Argument

Rejection under 35 USC 102(b)

1. Japanese patents 77 06,258, 76 42,057, 74 34,929, and 74 14,621 Do Not Anticipate Claims 1, 3-10, 12-31, 33, 35-43, and 123-126

JP 77 06,258 teaches the use of inorganic acid salts of polyvalent (≥ 2) metal(s) and amine, with an example of cobalt phosphate and NH_3.

JP 76 42,057 teaches the use of metal (valency ≥ 2) salts of organic acid(s), with an example of cobalt acetate.

JP 74 34,929 teaches the use of a water soluble compound containing a metal with an oxidation state ≥ 2 and aqueous solution of the acid salt of an organic amine, with an example of a bath containing aniline sulfate 4, H_2SO_4 3, $CoSO_4$ 1, and $CuSO_4$.

JP 74 14,621 teaches the use of an aqueous solution containing hydrazine and a Ni or Co salt. The Ni and Co salts may be acetates or sulfates.

The cobalt compounds taught in the Japanese patents, cobalt acetate, cobalt sulfate, and cobalt phosphate, have cobalt in the +2 state. As described in the specification at p. 13, line 27 to p. 14, line 8, cobalt sulfate and cobalt acetate can be used as divalent cobalt precursors. The cobalt compounds used in the Japanese patents are not cobalt/valence stabilizer complexes in which the cobalt is in the +3 or +4 oxidation state, as claimed.

The present application specifically calls for a cobalt ion in a cobalt/valence stabilizer complex that is at a higher oxidation state (trivalent and tetravalent cobalt) than the compounds taught by Japanese patents (divalent). The high oxidation states of these

ions are by their very nature metastable under typical aqueous solution conditions. These ions need to be treated specially as described in the application to retain their high oxidation state until needed. None of this is taught in the Japanese patents.

The indication of polyvalent ions in JP 77 06,258, 76 42,057, and 74 34,929 does not imply highly oxidized metal species. Polyvalent metal ion simply means that the ion has a charge of 2 or more. This might be a cobalt ion of +2 as taught by the references, or an aluminum ion of +3, a titanium ion of +4, and so on. The existence of a polyvalent charge does not imply oxidative capability. A very good example of this is chromium +3, the reduced form of the very toxic chromium +6. Chromium +3 is inert and is a necessary mineral for human health. The polyvalent +3 charge on chromium does nothing to prevent corrosion.

None of the Japanese patents teaches raising and keeping the oxidation state of the cobalt to +3 or +4 using a valence stabilizer so that the material would be effective as a corrosion inhibitor. The Japanese patents lack the valence stabilizers that are needed to keep the corrosion inhibition functionality after the solutions have been applied to the metal surfaces as is specifically described in the present application.

Moreover, JP 74 14,621 describes the use of hydrazine, which is a very toxic reducing agent. Its use and presence in a coating violates a basic feature of the claimed invention: it is a reducing agent. In the claimed invention, the cobalt should remain as oxidized as possible until it is available to be reduced at the bare metal surface. Hydrazine would reduce the oxidation state of the cobalt ion before it could be useful in protecting the metal surface. The presence of this reducing agent in an otherwise oxidized system would hinder the chemical protection offered by the oxidizer and would very likely worsen the degree of corrosion through the well known and understood mechanism of "dangerous inhibition" where there is a lack of sufficient oxidizer to protect the surface. The lack of sufficient oxidizer results in an incompletely oxidized metal surface and has been frequently demonstrated to cause severe pitting corrosion that results in a greater loss of strength than if nothing had been done to the scratch.

In addition, the Japanese patents do not teach about availability of the oxidizing species during exposure to water. Nor do the Japanese patents include solubility control agents.

Moreover, the Japanese patents do not mention the functional attributes necessary for successful use of cobalt +3 or +4 compounds. Many cobalt +3 and +4 compounds are unsuitable in rinses and seals because their solubility is either too high (i.e., cobalt (III) hexaamine chloride) or too low (i.e., $Co^{III}OOH$) in the formed coating. Tailoring to meet the physicochemical requirements is therefore frequently needed. The solubility and other physicochemical requirements, as well as any tailoring requirements, are not discussed in the Japanese patents.

Thus, the Japanese patents do not teach the claimed invention. The Japanese patents teach divalent cobalt compounds (sulfate, acetate, phosphate), not trivalent or tetravalent forms of cobalt in a cobalt/valence stabilizer complex. There are no oxidizers in the Japanese patents, and one cites a very strong reducing agent. The Japanese patents do not teach valence stabilizers, or solubility control agents. Nor do they teach the claimed solubility. Furthermore, the functional attributes necessary for the claimed invention are not even mentioned.

The examiner is not relying on the Japanese patents themselves to reject the claims, but rather on erroneous statements which were removed from the specification before filing. In the rejection, the examiner stated:

> Japanese patents 77 06,258, 76 42,057, 74 34,929, and 74 14,621, *as described in pages 9 and 10 of the specification submitted by the applicant on 3/7/2002 for example,* teaches compositions for seals which meet the requirements of the instant claims, including both a trivalent cobalt compound and a valence stabilizer compound.

Applicants discovered in preparing the Amendment filed May 17, 2005, that the substitute specification filed on February 28, 2002 in response to the Notice to File Corrected Application Papers was not the application as filed, but rather was an earlier draft version. This draft version included a discussion of the Japanese patents which has been cited by the examiner. However, the discussion of the Japanese patents was removed from the application prior to filing because it was highly speculative (i.e., possible, if, could possibly), and did not accurately reflect the teaching of the Japanese patents. The substitute specification which was filed June 30, 2005, and which is

identical to the specification as originally filed, does not include the discussion of the Japanese patents.

The discussion of the Japanese references contained in the substitute specification filed on February 28, 2002, was new matter because it was not in the application as filed. 35 U.S.C. § 132 states that no amendment shall introduce new matter into the disclosure of the invention. See 37 C.F.R. § 1.53(b), and 1.121(f). New matter cannot be introduced even if a supplemental oath or declaration is filed. 37 C.F.R. § 1.67(b). The introduction of new matter in an amendment is prohibited, and it must be canceled. MPEP 2163.06. Because the discussion of the Japanese references was new matter, it cannot be used to support the examiner's rejection.

The examiner stated that "Applicant's arguments that since all mention of the admitted prior art of the instant disclosure (Japanese patents 77 06,258, 76 42,057, 74 34,929, and 74 14,621) in the specification have been removed, that the Japanese patents 77 06,258, 76 42,057, 74 34,929, and 74 14,621 cannot be relied upon to anticipate the instant claims is not persuasive because applicant's description of these references in the manner relied upon by the examiner are of record in the instant application and admissions by the applicant, not only descriptions in the specification can be applied as prior art."

Applicants did not state and do not suggest that the Japanese patents cannot be relied upon by the examiner. Clearly, the Japanese patents can be relied on for what they reasonably teach to one skilled in the art. What the examiner cannot do, and what he is improperly doing, is rely on the statements in the February 28, 2002 specification which were new matter and thus not part of the specification.

The examiner's failure to reject any claims by citing the Japanese patents themselves (Chemical Abstracts summary) indicates the examiner's recognition that these references do not support the rejections.

Moreover, even if the examiner can rely on the statements made in the substitute specification (which is improper for the reasons stated above), the claims are not anticipated. With respect to Japanese Patent Nos. 77 06,258, 76 42,057, and 74 34,929, the statement was made that it "is *possible* that some of the cobalt may have been electrolytically oxidized to the trivalent oxidation state in the a.c. conditions. However,

this is not cited in the above-referenced patents. If trivalent cobalt were formed, then some of the amines cited (e.g., aniline) *could have resulted* in the "valence stabilization" of those trivalent cobalt ions, *but this also is not cited.* The processes described in these patents *"could" possibly have resulted* in the achievement of some trivalent cobalt/valence stabilizer complexes within the pores, resulting in the increased corrosion resistance noted by Ohta." This is merely a statement that the reference could have been modified in ways that are neither taught nor suggested by the reference. This statement does not anticipate any claims.

With respect to Japanese Patent No. 74 14,621, the statement was made that "the use of cobalt-containing seals to increase the corrosion resistance of anodic coatings that contain cobalt, hydrazine, and acids such as sulfosalicylic or aminopolycarboxylic acids. The reaction products of hydrazine and these acids would result in a satisfactory "valence stabilizer" compound, *however, this is not mentioned in the preceding patent references.* Furthermore, *no oxidation process is noted that would result in the conversion of divalent cobalt to the trivalent oxidation state.*" This is simply a statement that a valence stabilizer could have been formed. However, there is a clear statement that there is no trivalent cobalt, which means that there is no solid corrosion inhibiting seal "comprising cobalt, wherein the cobalt is trivalent cobalt, tetravalent cobalt, or combinations thereof, and a valence stabilizer combined to form a cobalt/valence stabilizer complex within the solid corrosion-inhibiting seal." Applicants' statement does not anticipate any claims.

A. Claims 1, 6-8, 12-19, 21-29, and 123

The Japanese patents do not teach a solid corrosion-inhibiting seal "comprising cobalt, wherein the cobalt is trivalent cobalt, tetravalent cobalt, or combinations thereof, and a valence stabilizer combined to form a cobalt/valence stabilizer complex within the solid corrosion-inhibiting seal," as in claim 1. There is no trivalent or tetravalent cobalt, and no valence stabilizer combined with trivalent or tetravalent cobalt to form a cobalt/valence stabilizer complex.

Furthermore, the Japanese patents do not teach a cobalt/valence stabilizer complex that has a "solubility in water of between about 5×10^{-1} and about 1×10^{-5} moles per liter of cobalt at about 25°C and about 760 Torr," as in claim 1. The solubility

of the cobalt compounds is not discussed, nor is there a discussion of the solubility requirements for a cobalt/valence stabilizer complex. Cobalt (II) sulfate has a solubility in water of 2.3×10^{0} mole/L, cobalt (II) acetate has a solubility in water of 1×10^{0} mole/L. See Table 4, p. 340. Cobalt (II) phosphate has a K_{sp} value of 2.05×10^{-35}, which converts to a cobalt solubility of 2.85×10^{-7} mole/L, which is well below the claimed lower limit. Moreover, the application states that trivalent cobalt acetate and trivalent cobalt sulfate are generally too soluble to serve as effective corrosion inhibitors if formed from a rinse or seal solution. See p. 17, lines 22-26.

B. Claim 3

The Japanese patents do not teach that a cobalt/valence stabilizer complex has a solubility "between about 5×10^{-2} and about 5×10^{-5} moles per liter of cobalt at about 25°C and about 760 Torr," as in claim 3. The solubility of the cobalt compounds is not discussed, nor is there a discussion of the solubility requirements for a cobalt/valence stabilizer complex. Cobalt (II) sulfate has a solubility in water of 2.3×10^{0} mole/L, cobalt (II) acetate has a solubility in water of 1×10^{0} mole/L. See Table 4, p. 340. Cobalt (II) phosphate has a solubility of 2.85×10^{-7} mole/L. Moreover, the application states that trivalent cobalt acetate and trivalent cobalt sulfate are generally too soluble to serve as effective corrosion inhibitors if formed from a rinse or seal solution. See p. 17, lines 22-26.

C. Claim 4

The Japanese patents do not teach that "there is an electrostatic barrier layer around the cobalt/valence stabilizer complex in aqueous solution," as in claim 4. Not all cobalt/valence stabilizer complexes form an electrostatic barrier in aqueous solution. See p. 11, lines 13-28, p. 12, lines 23-28, and p. 18, lines 4-28. The Japanese patents do not mention this characteristic.

D. Claim 5

The Japanese patents do not teach that "the cobalt/valence stabilizer complex acts as an ion exchange agent towards corrosive ions," as in claim 5. Not all cobalt/valence

stabilizer complexes act as ion exchange agents towards corrosive ions. See p. 11, line 30 to p. 12, line 6, p. 12, line 29 to p. 13, line 2 and p. 18, line 21 to p. 19, line 4. The Japanese patents do not mention this characteristic.

E. Claim 9

The Japanese patents do not teach the inorganic valence stabilizers of claim 9.

F. Claim 10

The Japanese patents do not teach that "the cobalt/valence stabilizer complex has a central cavity containing a cobalt ion and an additional ion," as in claim 10. Organic compounds and simple inorganic compounds bond directly to the cobalt ion. The valence stabilizers with a central cavity are the larger inorganic valence stabilizers that can polymerize, i.e., the heteropolymetallates, such as molybdate, tungstate, vanadate, etc. See p. 24, line 28 to p. 26, line 12, and p. 150, line 22 to p. 151, line 10. None of the compounds described in the Japanese patents has a central cavity with another ion in it.

G. Claim 20

The Japanese patents do not teach the amides of claim 20.

H. Claims 30-31

The Japanese patents do not teach that "a solubility of the cobalt/valence stabilizer complex in water is adjusted by an addition of a substituent group on the organic valence stabilizer," as in claim 30. The solubility of the cobalt compounds is not discussed, nor is any adjustment of solubility described. The Japanese patents do not teach increasing the solubility by adding the substituent groups of claim 31 to the organic valence stabilizer.

I. Claim 33

The Japanese patents do not teach that "an electrostatic barrier layer of the cobalt/valence stabilizer complex is adjusted by an addition of a substituent group on the organic valence stabilizer," as in claim 33. Not all cobalt/valence stabilizer complexes form an electrostatic barrier in aqueous solution. See p. 11, lines 13-28, p. 12, lines 23-

28, and p. 18, lines 4-28. The Japanese patents do not mention this characteristic, nor do they discuss any method of adjusting it.

J. Claims 35-40

The Japanese patents do not teach the use of a solubility control agent, as in claim 35. The solubility of the cobalt compounds is not discussed, nor is any method of controlling it described. The Japanese patents do not teach the use of cationic solubility control agents or anionic solubility control agents, as in claim 36. Nor do they teach the specific cationic solubility control agents of claims 37-38, or the specific anionic solubility control agents of claims 39-40.

K. Claims 41-43

The Japanese patents do not teach the use of a lubricity agent, as in claim 41, or the specific lubricity agents of claims 42-43. The lubricity of the coating is not discussed, nor is any method of altering it described.

L. Claim 124

The Japanese patents do not teach a "corrosion-inhibiting seal for a barrier film comprising cobalt, wherein the cobalt is trivalent cobalt, tetravalent cobalt, or combinations thereof, and a valence stabilizer combined to form a cobalt/valence stabilizer complex," where the valence stabilizer is one of those specified, and where the "cobalt/valence stabilizer complex has a central cavity containing a cobalt ion and an additional ion" with the additional ion being one of those specified.

In the Office Action of November 17, 2004, there were no prior art rejections of claim 11 as filed. As a result, in the Amendment of May 17, 2005, claim 11 was rewritten in independent form as claim 124. In the Office Action of July 6, 2005, the examiner stated that claim 11 and claim 124 were substantial duplicates, and claim 124 would be objected to if claim 11 was found allowable. There was no prior art rejection of claim 11 or claim 124. In the Amendment of October 6, 2005, Applicants explained that claim 11, which depended from claim 1 (claim 1 having been amended), included limitations that were not present in claim 124. In the Office Action of November 23,

2005, claim 11 (based an amended claim 1) was allowed. There was no prior art rejection of claim 11 (as filed, or as rewritten as claim 124) until the Office Action of November 23, 2005, where claim 124 was rejected over previously cited art without explanation.

M. Claim 125

The Japanese patents do not teach a "corrosion-inhibiting seal for a barrier film comprising cobalt, wherein the cobalt is trivalent cobalt, tetravalent cobalt, or combinations thereof, and a valence stabilizer combined to form a cobalt/valence stabilizer complex," where the valence stabilizer is one of the organic valence stabilizers specified, and where "a solubility of the cobalt/valence stabilizer complex in water is decreased by an addition of a substituent group on the organic valence stabilizer," and the substituent is one of those specified.

In the Office Action of November 17, 2004, there were no prior art rejections of claim 32 as filed. As a result, in the Amendment of May 17, 2005, claim 32 was rewritten in independent form as claim 125. In the Office Action of July 6, 2005, the examiner stated that claim 32 and claim 125 were substantial duplicates, and claim 125 would be objected to if claim 32 was found allowable. There was no prior art rejection of claim 32 or claim 125. In the Amendment of October 6, 2005, Applicants explained that claim 32, which depended from claim 1 (claim 1 having been amended), included limitations that were not present in claim 125. In the Office Action of November 23, 2005, claim 32 (based an amended claim 1) was allowed. There was no prior art rejection of claim 32 (as filed, or as rewritten as claim 125) until the Office Action of November 23, 2005, where claim 125 was rejected over previously cited art without explanation.

N. Claim 126

The Japanese patents do not teach that the "the cobalt/valence stabilizer complex is sparingly soluble in water at about 25°C and about 760 Torr," as claimed. The solubility of the cobalt compounds in the Japanese patents is not discussed, nor is there any discussion of the solubility required for a cobalt/valence stabilizer complex. Cobalt

(II) sulfate has a solubility in water of 2.3×10^0 mole/L, cobalt (II) acetate has a solubility in water of 1×10^0 mole/L. See Table 4, p. 340. The solubility of cobalt (II) phosphate is 2.85×10^{-7} mole/L. Moreover, the application states that trivalent cobalt acetate and trivalent cobalt sulfate are generally too soluble to serve as effective corrosion inhibitors if formed from a rinse or seal solution. See p. 17, lines 22-26

Therefore, claims 1, 3-10, 12-31, 33, 35-43, and 123-126 are not anticipated by Japanese patents 77 06,258, 76 42,057, 74 34,929, and 74 14,621.

Rejection under 35 USC 103(a)

2. Japanese patents 77 06,258, 76 42,057, 74 34,929, and 74 14,621 in view of Ouyang (U.S. Patent No. 5,505,792) Do Not Render Claims 44-53 Unpatentable

Ouyang teaches the addition of phthalo green pigment to a polyacrylamide based, dried-in-place, non-chromate conversion coating.

A. Claims 44, and 51-53

Ouyang, which involves a conversion coating process, cannot be combined with the Japanese patents which involve sealing anodized aluminum. These are very different processes. A conversion coating is formed during intentional exposure of metal to a chemically reactive solution. The metal is exposed to a compound that chemically alters the surface and forms a coating that provides a high degree of corrosion resistance. The protective film is produced by a chemical redox reaction between the metal surface and the conversion coating solution.

In contrast, the claimed seals are applied to anodized coatings, phosphate coatings, and black oxide coatings. Metals and metal alloys can have coatings such as anodized coatings, phosphate coatings, or black oxide coatings, applied to their surface for corrosion protection. These coatings frequently exhibit flaws, such as pores, pinholes or thin portions in the coating after formation and do not contain any inherent means to repair these coating breaches. The application of a second solution is necessary to fill the

pores in the coating and deposit compounds that will act as long-term corrosion protective species. See p. 2, lines 7-25.

Thus, there is no motivation to combine the Ouyang's conversion coating process with the sealing process of the Japanese patents.

Moreover, Ouyang does not remedy the deficiencies of Japanese patents 77 06,258, 76 42,057, 74 34,929, and 74 14,621, as discussed above with respect to claim 1.

B. Claims 45-48

Ouyang does not teach or suggest "an agent which improves color-fastness of the corrosion-inhibiting seal," as in claim 45, active and passive UV blockers, as in claim 46, the specific active UV blockers of claim 47, or the specific passive UV blockers of claim 48. The need to improve color-fastness is not discussed in either Ouyang or the Japanese patents, nor is there any discussion of compounds which can improve it.

C. Claims 49-50

Ouyang does not teach or suggest that "the agent which improves color-fastness is an agent which prevents smudging," as in claim 49, or the specific agents which prevent smudging of claim 50. Neither Ouyang nor the Japanese patents include any discussion of the need to improve color-fastness, any compounds which improve it, or any compounds which prevent smudging.

Therefore, claims 44-53 would not have been obvious to one of ordinary skill in the art at the time the invention was made.

Conclusion

For all of the above reasons, applicants submit that claims 1, 3-10, 12-31, 33, 35-53, and 123-126 are not anticipated by, or obvious in view of, the cited prior art. Applicants respectfully request that this Board reverse the rejections of the Examiner in their entirety.

Respectfully submitted,
DINSMORE & SHOHL LLP

By Richard A. Killworth
Richard A. Killworth
Registration No. 26,397

One Dayton Centre
One South Main Street, Suite 1300
Dayton, Ohio 45402-2023
Telephone: (937) 449-6400
Facsimile: (937) 449-6405

PLP/AMM/ems

CLAIMS APPENDIX

1. (Previously Presented) A solid corrosion-inhibiting seal formed on a coating selected from anodic coatings, phosphating coatings, or black oxide coatings, the solid corrosion-inhibiting seal comprising cobalt, wherein the cobalt is trivalent cobalt, tetravalent cobalt, or combinations thereof, and a valence stabilizer combined to form a cobalt/valence stabilizer complex within the solid corrosion-inhibiting seal, and wherein the cobalt/valence stabilizer complex has a solubility in water of between about 5×10^{-1} and about 1×10^{-5} moles per liter of cobalt at about 25°C and about 760 Torr.

2. (Canceled)

3. (Original) The corrosion-inhibiting seal of claim 2 wherein the solubility of the cobalt/valence stabilizer complex in water is between about 5×10^{-2} and about 5×10^{-5} moles per liter of cobalt at about 25°C and about 760 Torr.

4. (Original) The corrosion-inhibiting seal of claim 1 wherein there is an electrostatic barrier layer around the cobalt/valence stabilizer complex in aqueous solution.

5. (Original) The corrosion-inhibiting seal of claim 1 wherein the cobalt/valence stabilizer complex acts as an ion exchange agent towards corrosive ions.

6. (Previously Presented) The corrosion-inhibiting seal of claim 1 wherein the anodic coatings, phosphating coatings, or black oxide coatings comprise a compound selected from oxides, hydroxides, phosphates, carbonates, oxalates, silicates, aluminates, borates, and polymers, and combinations thereof.

7. (Previously Presented) The corrosion-inhibiting seal of claim 1 wherein the valence stabilizer is selected from an inorganic valence stabilizer.

8. (Original) The corrosion-inhibiting seal of claim 7 wherein the valence

stabilizer is the inorganic valence stabilizer selected from molybdates, tungstates, vanadates, niobates, tantalates, tellurates, periodates, iodates, carbonates, antimonates, stannates, titanates, zirconates, hafnates, bismuthates, germanates, arsenates, phosphates, borates, aluminates, and silicates, and combinations thereof.

9. (Original) The corrosion-inhibiting seal of claim 8 wherein the valence stabilizer is the inorganic valence stabilizer selected from molybdates, tungstates, vanadates, niobates, tantalates, tellurates, periodates, iodates, carbonates, antimonates, and stannates, and combinations thereof.

10. (Original) The corrosion-inhibiting seal of claim 8 wherein the cobalt/valence stabilizer complex has a central cavity containing a cobalt ion and an additional ion.

11. (Original) The corrosion-inhibiting seal of claim 10 wherein the additional ion is B^{+3}, Al^{+3}, Si^{+4}, P^{+5}, Ti^{+4}, V^{+5}, V^{+4}, Cr^{+6}, Cr^{+3}, Mn^{+4}, Mn^{+3}, Mn^{+2}, Fe^{+3}, Fe^{+2}, Co^{+2}, Ni^{+2}, Ni^{+3}, Ni^{+4}, Cu^{+2}, Cu^{+3}, Zn^{+2}, Ga^{+3}, Ge^{+4}, As^{+5}, As^{+3}, Zr^{+4}, or Ce^{+4}.

12. (Previously Presented) The corrosion-inhibiting seal of claim 123 wherein the valence stabilizer is the organic valence stabilizer selected from monoamines; diamines; triamines; tetraamines; pentamines; hexamines; five- or six-membered heterocyclic rings containing one to four nitrogen atoms optionally having additional nitrogen, sulfur, or oxygen binding sites; five- or six-membered heterocyclic rings containing one or two sulfur atoms and having additional nitrogen binding sites; five- or six-membered heterocyclic rings containing one or two oxygen atoms and having additional nitrogen binding sites; (two-, three-, four-, six-, eight-, or ten-)membered nitrogen, nitrogen-sulfur, or nitrogen-oxygen macrocyclics; macrocyclic oligothioketones or dithiolenes; diazenes; thio-, amido-, or imido- derivatives of hypophosphoric, phosphoric, or diphosphoric acids and salts; azo compounds, triazenes, formazans, azines, hydrazones, or Schiff Bases containing at least two azo, imine, or azine groups; azo compounds, triazenes, formazans, azines, hydrazones, or Schiff Bases with ortho- (for aryl) or alpha- or beta- (for alkyl) substitution; oximes; amidines and imido compounds; dithio ligands; amides; amino

acids; N-(thio)acyl 7-aminobenzylidenimines; (thio)hydroxamates; alpha- or ortho-aminothio(di)carboxylic acids and salts; (thio)semicarbazones; (thio)acyl hydrazones; (thio)carbazones; silylaminoalcohols; thioalkyl amines and imines; hydroxyalkyl imines; (thio)aryl amines and imines; guanylureas; guanidinoureas; 2-nitrosophenols; 2-nitrophenols; N-nitrosohydroxylamines; 1,3-monothioketones; monothiomalonamides; 2-thioacylacetamides; 2-acylthioacetamides; dithiodicarbonic diamides; trithiodicarboxylic acids and salts; monothiocarbamates; monothioethers; dithioethers; trithioethers; tetrathioethers; pentathioethers; hexathioethers; disulfides; monophosphines; diphosphines; triphosphines; tetraphosphines; pentaphosphines; hexaphosphines; five- or six-membered heterocyclic rings containing one or two sulfur atoms optionally having additional sulfur, oxygen, or phosphorus binding sites; five- or six-membered heterocyclic rings containing one to three phosphorus atoms optionally having additional phosphorus, nitrogen, oxygen, or sulfur binding sites; five- or six-membered heterocyclic rings containing one to four nitrogen atoms and having additional phosphorus binding sites; five- or six-membered heterocyclic rings containing one or two oxygen atoms and having additional sulfur or phosphorus binding sites; (five-, seven-, or nine-)membered nitrogen, nitrogen-sulfur, or nitrogen-oxygen macrocyclics; (two- to ten-)membered sulfur, sulfur-oxygen, or sulfur-phosphorus macrocyclics, not including oligothioketones or dithiolenes; (two- to ten-)membered phosphorus, nitrogen-phosphorus, or oxygen-phosphorus macrocyclics; thio-, amido-, or imido- derivatives of phosphonic and diphosphonic acids and salts containing no sulfur binding sites; amido-, or imido-derivatives of hypophosphoric, phosphoric, or diphosphoric acids and salts containing no sulfur binding sites; dithioperoxydiphosphoramides; dithioperoxydiphosphoric acids and salts; monothioperoxydiphosphoramides; monothioperoxydiphosphoric acids and salts; monothiophosphoric acids; phosphoro(dithioperoxoic) acids and salts; azo compounds, triazenes, formazans, azines, or Schiff Bases; silylamines; silazanes; guanidines and diguanidines; pyridinaldimines; hydrazones; hydramides; nitriles; thioureas and thioamides; ureas and biurets; monothio ligands; diketone ligands; dithioacyl disulfides; tetrathioperoxydicarbonic diamides; (hexa-, penta-, or tetra-)thioperoxydicarbonic acids and salts; 1,2-dithiolates; rhodanines; dithiocarbimates; (thio)xanthates; S-(alkyl- or aryl-thio)thiocarboxylic acids and salts; phosphinodithioformates; (thio)borates and

(thio)boronates; (thio)arsonic acids and salts; (thio)antimonic acids and salts; phosphine and arsine sulfides or oxides; beta-hydroxyketones and –aldehydes; squaric acids and salts; carbamates and carbimates; carbazates; imidosulfurous diamides; sulfurdiimines; thiocarbonyl and mercapto oximes; 2-nitrothiophenols; 2-nitrilo(thio)phenols; acylcyanamides, imidates; 2-amidinoacetates; beta-ketoamines; 3-aminoacrylamides and 3,3-diaminoacrylamides; 3-aminoacrylic acids and salts and 3-hydroxy-3-aminoacrylic acids and salts; 2-nitroanilines; amine and diazine N-oxides; hydrazides and semicarbazides; (amino- or imino-)aryl phosphines; (thio- or hydroxy-)aryl phosphines; arsines; five- or six-membered heterocyclic rings containing one arsenic atom optionally having additional arsenic binding sites;(two- to six-)membered arsenic macrocyclics; selenoethers; five- or six-membered heterocyclic rings containing one or two selenium atoms optionally having additional selenium binding sites; (two- to six-)membered selenium macrocyclics; 1,3-diselenoketones; 1,1-diselenolates; diselenocarbamates; selenophosphoric acids and salts; selenocarbonates; cyanide, isocyanide, and cyanamide ligands; nitrosyl and nitrite ligands; azide ligands; thiolates and selenolates; (thio)cyanate ligands; diene or bicyclic or tricyclic hydrocarbon ligands; and carbonyl, halogen, or hydroxo ligands; and combinations thereof.

13. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is selected from monoamines; diamines; triamines; tetraamines; pentamines; hexamines; five- or six-membered heterocyclic rings containing one to four nitrogen atoms optionally having additional nitrogen, sulfur, or oxygen binding sites; five- or six-membered heterocyclic rings containing one or two sulfur atoms and having additional nitrogen binding sites; five- or six-membered heterocyclic rings containing one or two oxygen atoms and having additional nitrogen binding sites; (two-, three-, four-, six-, eight-, or ten-)membered nitrogen, nitrogen-sulfur, or nitrogen-oxygen macrocyclics; macrocyclic oligothioketones or dithiolenes; diazenes; thio-, amido-, or imido- derivatives of hypophosphoric, phosphoric, or diphosphoric acids and salts; azo compounds, triazenes, formazans, azines, hydrazones, or Schiff Bases containing at least two azo, imine, or azine groups; azo compounds, triazenes, formazans, azines, hydrazones, or Schiff Bases with ortho- (for aryl) or alpha- or beta- (for alkyl) substituted

azo compounds, triazenes, formazans, axines, hydrazones, or Schiff Bases; oximes; amidines and imido compounds; dithio ligands; amides; amino acids; N-(thio)acyl 7-aminobenzylidenimines; (thio)hydroxamates; alpha- or ortho-aminothio(di)carboxylic acids and salts; (thio)semicarbazones; (thio)acyl hydrazones; (thio)carbazones; silylaminoalcohols; thioalkyl amines and imines; hydroxyalkyl imines; (thio)aryl amines and imines; guanylureas; guanidinoureas; 2-nitrosophenols; 2-nitrophenols; N-nitrosohydroxylamines; 1,3-monothioketones; monothiomalonamides; 2-thioacylacetamides; 2-acylthioacetamides; dithiodicarbonic diamides; trithiodicarboxylic acids and salts; and monothiocarbamates; and combinations thereof.

14. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the diazene selected from diazeneformimidamides; diazeneformamides; diazeneformothioamides; diazeneacetimidamides; diazeneacetothioamides; diazeneformimidic acids and salts; diazeneacetimidic acids and salts; diazenecarbothioic acids and salts; diazenecarbodithioic acids and salts; diazeneformimidothioic acids and salts; diazeneformaldehydes; diazeneformothioaldehydes; diazeneacetaldehydes; diazeneacetothioaldehydes; diazenediformamides; diazenediformothioamides; diazenediacetamides; diazenediacetothioamides; diazeneacetimidothioic acids and salts; imidoyldiazenes; diazenediformimidamides; diazenediacetimidamides; diazenediformimidic acids and salts; diazenediacetimidic acids and salts; diazenediformimidothioic acids and salts; diazenediacetimidothioic acids and salts; diazenedicarbothioic acids; diazenedicarbodithioic acids; diazeneformic acids; diazenediformic acids; diazeneacetic acids; diazenediacetic acids; diazenediformaldehydes; diazenediformothioaldehydes; diazenediacetaldehydes; diazenediacetothioaldehydes; and diimidoyldiazenes; and combinations thereof.

15. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the thio-, amido-, or imido- derivatives of hypophosphoric, phosphoric, or diphosphoric acids and salts selected from phosphoramidimidic triamides; phosphoramidimidic acids and salts; phosphorodiamidimidic acids and salts;

phosphorodiamidimidothioic acids and salts; phosphoramidimidothioic acids and salts; phosphorodiamidimidodithioic acids and salts; phosphoramidimidodithioic acids and salts; (di- or mono-)thiohypophosphoric acids and salts; (di- or mono-)thiohypophosphoramides; phosphoramidic acids and salts; phosphorimidic acids and salts; (di- or mono-)thioimidodiphosphoric acids and salts; (di- or mono-)thiohydrazidodiphosphoric acids and salts; (di- or mono-)thioimidodiphosphoramides; (di- or mono-)thiohydrazidodiphosphoramides; phosphoric triamides; (di- or mono-)thiodiphosphoramides; (di- or mono-)thiodiphosphoric acids and salts; (tetra-, tri-, di-)thiophosphoric acids and salts; phosphoro(dithioperoxo)(mono-,di-, or tri-)thioic acids and salts; phosphorimido(mono-, di-, or tri-)thioic acids and salts; phosphorothioic triamides; phosphoramido(mono, di- or tri-)thioic acids and salts; and phosphorodiamido(mono, di- or tri-)thioic acids and salts; and combinations thereof.

16. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is a substituent for the ortho- (for aryl) or alpha- or beta- (for alkyl) substituted azo compounds, triazenes, formazans, azines, hydrazones, or Schiff Bases selected from amino; imino; oximo; diazeno; hydrazido; thiol; mercapto; thiocarbonyl; hydroxy; carbox; and carbonyl substituents, and combinations thereof.

17. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the oxime selected from monooximes; dioximes; carbonyl oximes; imine oximes; hydroxy oximes; amino oximes; amido oximes; hydrazone oximes; and azo oximes; and combinations thereof.

18. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the amidine and imido compound selected from amidines; diamidines; biguanides; biguanidines; diamidinomethanes; imidoylguanidines; amidinoguanidines; diformamidine oxides, sulfides, and disulfides; imidodicarbonimidic acids and salts; diimidodicarbonimidic acids and salts; thioimidodicarbonimidic acids and salts; thiodiimidodicarbonimidic acids and salts; diimidoylimines; diimidoylhydrazides; imidosulfamides; diimidosulfamides; O-amidinocarbamates; O- or S-amidino(mono-, di-,

or peroxy-)thiocarbamates; N-hydroxy(or N,N'-dihydroxy)amidines; and diimidosulfuric acids and salts; and combinations thereof.

19. (Original) The corrosion-inhibiting seal of claim 14 wherein the organic valence stabilizer is the dithio ligand selected from dithioimidodialdehydes; dithiohydrazidodialdehydes; dithioimidodicarbonic acids and salts; dithiohydrazidodicarbonic acids and salts; 1,3-dithioketones; 1,2-dithioketones; dithiomalonamides; 2-thioacylthioacetamides; dithioacyl sulfides; trithiodicarbonic diamides; (penta-, tetra-, tri-)thiodicarbonic acids and salts; beta-mercaptothioketones and –aldehydes; N-(aminomethylthiol)thioureas; dithiooxamides; 1,1-dithiolates; (di- or per-)thiomonocarboxylic acids and salts; (tetra- or per-)thiodicarboxylic acids and salts; (di-, tri-, or per-)thiocarbonates; dithiocarbamates (including N-hydroxydithiocarbamates and N-mercaptodithiocarbamates); and dithiocarbazates; and combinations thereof.

20. (Original) The corrosion-inhibiting seal of claim 14 wherein the organic valence stabilizer is the amide selected from monoamides; lactams; amidinoamides; guanidinoamides; imidoylamides; polyamides; and polylactams; and combinations thereof.

21. (Original) The corrosion-inhibiting seal of claim 14 wherein the organic valence stabilizer is the thio-, amido-, or imido- derivative of phosphonic and diphosphonic acids and salts selected from phosphonitrile amides; phosphonimidic diamides; phosphonamidimidic acids and salts; phosphonamidimidothioic acids and salts; dithioimidodiphosphonic acids and salts; dithiohydrazidodiphosphonic acids and salts; dithioimidodiphosphonamides; dithiohydrazidodiphosphonamides; dithiodiphosphonamides; dithiodiphosphonic acids and salts; dithioperoxydiphosphonamides; dithioperoxydiphosphonic acids and salts; (di- and tri-)thiophosphonic acids and salts; phosphono(dithioperoxo)thioic acids and salts; phosphono(dithioperoxo)dithioic acids and salts; phosphonimidothioic acids and salts; phosphonimidodithioic acids and salts; phosphonothioic acids and salts; phosphonanidothioic acids and salts; phosphonamidimidodithioic acids and salts;

monothioimidodiphosphonic acids and salts; monothiohydrazidodiphosphonic acids and salts; monothioimidodiphosphonamides; monothiohydrazidodiphosphonamides; monothiodiphosphonamides; monothiodiphosphonic acids and salts; monothioperoxydiphosphonamides; monothioperoxydiphosphonic acids and salts; monothiophosphonic acids and salts; and phosphono(dithioperoxoic) acids and salts; and combinations thereof.

22. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the amido-, or imido- derivative of hypophosphoric, phosphoric, or diphosphoric acids and salts containing no sulfur binding sites selected from hypophosphoric acids and salts; hypophosphoramides; imidodiphosphoric acids and salts; hydrazidodiphosphoric acids and salts; imidodiphosphoramides; hydrazidodiphosphoramides; and diphosphoramides; and combinations thereof.

23. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the amido-, or imido- derivative of phosphonic or diphosphonic acids and salts containing no sulfur binding sites selected from imidodiphosphonic acids and salts; hydrazidodiphosphonic acids and salts; imidodiphosphonamides; hydrazidodiphosphonamides; diphosphonamides; phosphonimidic acids and salts; phosphonamidic acids and salts; and phosphonic diamides; and combinations thereof.

24. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the thiourea and thioamide selected from thioureas; thiocarboxamides; thioacylthioureas, acylthioureas, and thioacylureas; thioaroylthioureas, aroylthioureas, and thioaroylureas; thioimidates; thioguanylureas; guanidinothioureas; amidinothioamides; guanidinothioamides; imidoylthioamides; 3-aminothioacrylamides; thiohydrazides; thiosemicarbazides; (mono- and di-)thiobiurets; (mono- and di-)thioisobiurets; (mono- and di-)thiobiureas; N-(aminomethylol)thioureas; N-(aminomethylthiol)ureas; and beta-mercaptocarboxamides; and combinations thereof.

25. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the urea and biuret selected from ureas; pseudoureas; biurets, isobiurets; biureas; acylureas; aroylureas; and N-(aminomethylol)ureas; and combinations thereof.

26. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the monothio ligand selected from beta-aminothiones; 3-aminothioacrylic acids and salts; 3-mercapto-3-aminothioacrylic acids and salts; N-thioacyl benzylidenimines; thioimidodialdehydes; thiohydrazidodialdehydes; thioimidodicarbonic acids and salts; thiohydrazidodicarbonic acids and salts; 1,2-monothioketones; trithioperoxydicarbonic diamides; dithioperoxydicarbonic diamides; dithiodicarbonic acids and salts; trithioperoxydicarbonic acids and salts; beta-hydroxythioketones; beta-hydroxythioaldehydes; beta-mercaptoketones; beta-mercaptoaldehydes; monothiooxamides; beta-mercaptocarboxylic acids and salts; beta-mercaptothiocarboxylic acids and salts; beta-hydroxythiocarboxylic acids and salts; S-alkylthiocarboxylic acids and salts; S-arylthiocarboxylic acids and salts; S-alkyldisulfidocarboxylic acids and salts; S-aryldisulfidocarboxylic acids and salts; monothiomonocarboxylic acids and salts; dithiodicarboxylic acids and salts; monothiocarbonates; monothiocarbazates; monothiocarbimates; mercaptoalcohols; and silylmercaptoalcohols; and combinations thereof.

27. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the diketone ligand selected from imidodialdehydes; hydrazidodialdehydes; imidodicarbonic acids and salts; hydrazidodicarbonic acids and salts; imidodisulfamic acids and salts; imidodisulfuric acids and salts; 1,3-diketones; 1,2-diketones; malonamides; 2-acylacetamides; monothiodicarbonic diamides; monothiodicarbonic acids and salts; dithioperoxydicarbonic acids and salts; trithionic acids and salts; oxamides; and dicarboxylic acids; and combinations thereof.

28. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the S-(alkyl- or aryl-thio)thiocarboxylic acid and salt selected from

S-(alkylthio)thiocarboxylic acids and salts; S-(arylthio)thiocarboxylic acids and salts; S,S-thiobisthiocarboxylic acids and salts; S-(alkyldisulfido)thiocarboxylic acids and salts; S-(aryldisulfido)thiocarboxylic acids and salts; and S,S'-disulfidobisthiocarboxylic acids and salts; and combinations thereof.

29. (Original) The corrosion-inhibiting seal of claim 12 wherein the organic valence stabilizer is the phosphine and arsine sulfide or oxide selected from phosphine P-sulfides; aminophosphine sulfides; arsine As-sulfides; aminoarsine sulfides; phosphine P-oxides; aminophosphine oxides; arsine As-oxides; and aminoarsine oxides; and combinations thereof.

30. (Original) The corrosion-inhibiting seal of claim 12 wherein a solubility of the cobalt/valence stabilizer complex in water is adjusted by an addition of a substituent group on the organic valence stabilizer.

31. (Original) The corrosion-inhibiting seal of claim 30 wherein the solubility in water of the cobalt/valence stabilizer complex in water is increased by the addition of the substituent group selected from sulfonate groups ($-SO_3^-$), carboxyl groups ($-CO_2-$), hydroxyl groups (-OH), ester groups ($-CO_3-$), carbonyl groups (=C=O), amine groups ($-NH_2$), nitrosamine groups (=N-N=O), carbonylnitrene groups (-CO-N), sulfoxide groups (=S=O), sulfone groups ($=S[=O]_2$), sulfinyl groups (-N=S=O), sulfodiimines ($=S[=NH]_2$), sulfonyl halide groups ($-S[=O]_2X$), sulfonamide groups ($-S[=O]_2NH_2$), monohalosulfonamide groups ($-S[=O]_2NHX$), dihalosulfonamide groups ($-S[=O]_2MX_2$), halosulfonate groups ($-S[=O]_2OX$), halosulfonate amide groups ($=N-S[=O]_2X$), aminosulfonate groups ($=N-S[=O]_2OH$), iminosulfonate groups ($-N[SO_3^-]_{1-2}$), phosphonate groups ($-PO_3^{-2}$), phosphonamide groups ($-PO_2NH_2^-$), phosphondiamide groups ($-PO[NH_2]_2$), aminophosphonate groups ($=N-PO_3^{-2}$), and iminophosphonate groups ($-N[PO_3^{-2}]_{1-2}$), and combinations thereof.

32. (Original) The corrosion-inhibiting seal of claim 30 wherein the solubility in water of the cobalt/valence stabilizer complex in water is decreased by the addition of the

substituent group selected from nitro groups ($-NO_2$), perfluoroalkyl groups ($-C_xF_{2x+1}$), perchloroalkyl groups ($-C_xCl_{2x+1}$), nitramine groups ($=N-NO_2$), thioketone groups ($=C=S$), sulfenyl halide groups ($-S-X$), and sulfur dihaloimide groups ($-N=SX_2$), and combinations thereof.

33. (Original) The corrosion-inhibiting seal of claim 12 wherein an electrostatic barrier layer of the cobalt/valence stabilizer complex is adjusted by an addition of a substituent group on the organic valence stabilizer.

34. (Original) The corrosion-inhibiting seal of claim 33 wherein the electrostatic barrier layer is increased by the addition of the substituent group selected from ketones ($=C=O$), thioketones ($=C=S$), amides ($-C[=O]-NR_2$), thioamides ($-C[=S]-NR_2$), nitriles or cyano groups, ($-CN$), isocyanides ($-NC$), nitroso groups ($-N=O$), thionitroso groups ($-N=S$), nitro groups ($-NO_2$), azido groups ($-N_3$), cyanamide or cyanonitrene groups ($=N-CN$), cyanate groups ($-O-CN$), isocyanate groups ($-N=C=O$), thiocyanate groups ($-S-CN$), isothiocyanate groups ($-N=C=S$), nitrosamine groups ($=N-N=O$), thionitrosamine groups ($=N-N=S$), nitramine groups ($=N-NO_2$), thionitramine groups ($=N-NS_2$), carbonylnitrene groups ($-CO-N$), thiocarbonylnitrene groups ($-CS-N$), sulfenyl halides ($-S-X$), sulfoxides ($=S=O$), sulfones ($=S[=O]_2$), sulfinyl groups ($-N=S=O$), thiosulfinyl groups ($-N=S=S$), sulfenyl thiocyanato groups ($-S-S-CN$), sulfenyl cyanato groups ($-S-O-CN$), sulfodiimine groups ($=S[=NH]_2$), sulfur dihaloimido groups ($-N=SX_2$), sulfur oxide dihaloimido groups ($-N=S[=O]X_2$), aminosulfur oxide trihalide groups ($=N-S[=O]X_3$), sulfonyl azide groups ($-S[=O]_2N_3$), sulfonyl thiocyanate groups ($-S[=O]_2SCN$), sulfonyl cyanate groups ($-S[=O]_2OCN$), sulfonyl cyanide groups ($-S[=O]_2CN$), halosulfonate groups ($-S[=O]_2OX$), phosphonyl thiocyanate groups ($-P[=O]OHSCN$), phosphonyl cyanate groups ($-P[=O]OHOCN$), and phosphonyl cyanide groups ($-P[=O]OHCN$), and combinations thereof.

35. (Original) The corrosion-inhibiting seal of claim 1 further comprising a solubility control agent.

36. (Original) The corrosion-inhibiting seal of claim 35 wherein the solubility control agent is selected from a cationic solubility control agent and an anionic solubility control agent.

37. (Original) The corrosion-inhibiting seal of claim 36 wherein the solubility control agent is the cationic solubility control agent selected from H^+, Li^+, Na^+, K^+, Rb^+, Cs^+, NH_4^+, Mg^{+2}, Ca^{+2}, Sr^{+2}, Be^{+2}, Ba^{+2}, Y^{+3}, La^{+3}, Ce^{+3}, Ce^{+4}, Nd^{+3}, Pr^{+3}, Sc^{+3}, Sm^{+3}, Eu^{+3}, Eu^{+2}, Gd^{+3}, Tb^{+3}, Dy^{+3}, Ho^{+3}, Er^{+3}, Tm^{+3}, Yb^{+3}, Lu^{+3}, Ti^{+4}, Zr^{+4}, Ti^{+3}, Hf^{+4}, Nb^{+5}, Ta^{+5}, Nb^{+4}, Ta^{+4}, V^{+5}, V^{+4}, V^{+3}, Mo^{+6}, W^{+6}, Mo^{+5}, W^{+5}, Mo^{+4}, W^{+4}, Cr^{+3}, Mn^{+2}, Mn^{+3}, Mn^{+4}, Fe^{+2}, Fe^{+3}, Co^{+2}, Co^{+3}, Ni^{+2}, Ni^{+3}, Ni^{+4}, Ru^{+2}, Ru^{+3}, Ru^{+4}, Rh^{+3}, Ir^{+3}, Rh^{+2}, Ir^{+2}, Pd^{+4}, Pt^{+4}, Pd^{+2}, Pt^{+2}, Os^{+4}, Cu^+, Cu^{+2}, Cu^{+3}, Ag^+, Ag^{+2}, Ag^{+3}, Au^+, Au^{+2}, Au^{+3}, Zn^{+2}, Cd^{+2}, Hg^+, Hg^{+2}, Al^{+3}, Ga^{+3}, Ga^+, In^{+3}, In^+, Tl^{+3}, Tl^+, Ge^{+4}, Ge^{+2}, Sn^{+4}, Sn^{+2}, Pb^{+4}, Pb^{+2}, Sb^{+3}, Sb^{+5}, As^{+3}, As^{+5}, Bi^{+3}, Bi^{+5}, organic compounds containing at least one N^+ site, organic compounds containing at least one phosphonium site, organic compounds containing at least one arsonium site, organic compounds containing at least one stibonium site, organic compounds containing at least one oxonium site, organic compounds containing at least one sulfonium site, organic compounds containing at least one selenonium site, organic compounds containing at least one iodonium site, and quaternary ammonium compounds having a formula NR_4^+, where R is an alkyl, aromatic, or acyclic organic constituent, and combinations thereof.

38. (Original) The corrosion-inhibiting seal of claim 37 wherein the cationic solubility control agent is selected from H^+, Li^+, Na^+, K^+, Rb^+, Cs^+, NH_4^+, Mg^{+2}, Ca^{+2}, Sr^{+2}, Y^{+3}, La^{+3}, Ce^{+3}, Ce^{+4}, Nd^{+3}, Pr^{+3}, Sc^{+3}, Sm^{+3}, Eu^{+3}, Eu^{+2}, Gd^{+3}, Tb^{+3}, Dy^{+3}, Ho^{+3}, Er^{+3}, Tm^{+3}, Yb^{+3}, Lu^{+3}, Ti^{+4}, Zr^{+4}, Ti^{+3}, Hf^{+4}, Nb^{+5}, Ta^{+5}, Nb^{+4}, Ta^{+4}, Mo^{+6}, W^{+6}, Mo^{+5}, W^{+5}, Mo^{+4}, W^{+4}, Mn^{+2}, Mn^{+3}, Mn^{+4}, Fe^{+2}, Fe^{+3}, Co^{+2}, Co^{+3}, Ru^{+2}, Ru^{+3}, Ru^{+4}, Rh^{+3}, Ir^{+3}, Rh^{+2}, Ir^{+2}, Pd^{+4}, Pt^{+4}, Pd^{+2}, Pt^{+2}, Cu^+, Cu^{+2}, Cu^{+3}, Ag^+, Ag^{+2}, Ag^{+3}, Au^+, Au^{+2}, Au^{+3}, Zn^{+2}, Al^{+3}, Ga^{+3}, Ga^+, In^{+3}, In^+, Ge^{+4}, Ge^{+2}, Sn^{+4}, Sn^{+2}, Sb^{+3}, Sb^{+5}, Bi^{+3}, Bi^{+5}, organic compounds containing at least one N^+ site, organic compounds containing at least one phosphonium site, organic compounds containing at least one stibonium site, organic compounds containing at least one oxonium site, organic compounds containing at least

one sulfonium site, organic compounds containing at least one iodonium site, and quaternary ammonium compounds having a formula NR_4^+, where R is an alkyl, aromatic, or acyclic organic constituent, and combinations thereof.

39. (Original) The corrosion-inhibiting seal of claim 36 wherein the solubility control agent is the anionic solubility control agent selected from fluorotitanates, chlorotitanates, fluorozirconates, chlorozirconates, fluoroniobates, chloroniobates, fluorotantalates, chlorotantalates, molybdates, tungstates, permanganates, fluoromanganates, chloromanganates, fluoroferrates, chloroferrates, fluorocobaltates, chlorocobaltates, fluorozincates, chlorozincates, borates, fluoroborates, fluoroaluminates, chloroaluminates, carbonates, silicates, fluorosilicates, fluorostannates, nitrates, nitrites, azides, cyanamides, phosphates, phosphites, phosphonates, phosphinites, thiophosphates, thiophosphites, thiophosphonates, thiophosphinites, fluorophosphates, fluoroantimonates, chloroantimonates, sulfates, sulfites, sulfonates, thiosulfates, dithionites, dithionates, fluorosulfates, tellurates, fluorides, chlorides, chlorates, perchlorates, bromides, bromates, iodides, iodates, periodates, heteropolyanions, ferricyanides; ferrocyanides; cyanocobaltates; cyanocuprates; cyanomanganates; cyanates; cyanatoferrates; cyanatocobaltates; cyanatocuprates; cyanatomanganates; thiocyanates; thiocyanatoferrates; thiocyanatocobaltates; thiocyanatocuprates; thiocyanatomanganates; cyanamides; cyanamidoferrates; cyanamidocobaltates; cyanamidocuprates; cyanamidomanganates; nitritoferrates; nitritocobaltates; azides; (thio)carboxylates, di(thio)carboxylates, tri(thio)carboxylates, tetra(thio)carboxylates; (thio)phenolates, di(thio)phenolates, tri(thio)phenolates, tetra(thio)phenolates; (thio)phosphonates, di(thio)phosphonates, tri(thio)phosphonates; (thio)phosphonamides, di(thio)phosphonamides, tri(thio)phosphonamides; amino(thio)phosphonates, diamino(thio)phosphonates, triamino(thio)phosphonates; imino(thio)phosphonates, diimino(thio)phosphonates; (thio)sulfonates, di(thio)sulfonates, tri(thio)sulfonates; (thio)sulfonamides, di(thio)sulfonamides, tri(thio)sulfonamides; amino(thio)sulfonates, diamino(thio)sulfonates, triamino(thio)sulfonates; imino(thio)sulfonates, diimino(thio)sulfonates; (thio)borates, di(thio)borates, (thio)boronates; organic silicates; stibonates; cyanides; cyanochromates; cyanonickelates; cyanatochromates;

cyanatonickelates; thiocyanatochromates; thiocyanatonickelates; cyanamidochromates; cyanamidonickelates; nitritonickelates; arsonates, diarsonates, triarsonates; organic selenates, diselenates, triselenates; arsenates, arsenites, fluoroarsenates, chloroarsenates, selenates, selenites, fluorothallates, chlorothallates, iodomercury anions, chloromercurates, bromomercurates, osmates, fluoronickelates, chromates, Reinecke's salt, and vanadates, and combinations thereof.

40. (Original) The corrosion-inhibiting seal of claim 39 wherein the anionic solubility control agent is selected from fluorotitanates, chlorotitanates, fluorozirconates, chlorozirconates, fluoroniobates, chloroniobates, fluorotantalates, chlorotantalates, molybdates, tungstates, permanganates, fluoromanganates, chloromanganates, fluoroferrates, chloroferrates, fluorocobaltates, chlorocobaltates, fluorozincates, chlorozincates, borates, fluoroborates, fluoroaluminates, chloroaluminates, carbonates, silicates, fluorosilicates, fluorostannates, nitrates, nitrites, azides, cyanamides, phosphates, phosphites, phosphonates, phosphinites, thiophosphates, thiophosphites, thiophosphonates, thiophosphinites, fluorophosphates, fluoroantimonates, chloroantimonates, sulfates, sulfites, sulfonates, thiosulfates, dithionites, dithionates, fluorosulfates, tellurates, fluorides, chlorides, chlorates, perchlorates, bromides, bromates, iodides, iodates, periodates, heteropolyanions, ferricyanides; ferrocyanides; cyanocobaltates; cyanocuprates; cyanomanganates; cyanates; cyanatoferrates; cyanatocobaltates; cyanatocuprates; cyanatomanganates; thiocyanates; thiocyanatoferrates; thiocyanatocobaltates; thiocyanatocuprates; thiocyanatomanganates; cyanamides; cyanamidoferrates; cyanamidocobaltates; cyanamidocuprates; cyanamidomanganates; nitritoferrates; nitritocobaltates; azides; (thio)carboxylates, di(thio)carboxylates, tri(thio)carboxylates, tetra(thio)carboxylates; (thio)phenolates, di(thio)phenolates, tri(thio)phenolates, tetra(thio)phenolates; (thio)phosphonates, di(thio)phosphonates, tri(thio)phosphonates; (thio)phosphonamides, di(thio)phosphonamides, tri(thio)phosphonamides; amino(thio)phosphonates, diamino(thio)phosphonates, triamino(thio)phosphonates; imino(thio)phosphonates, diimino(thio)phosphonates; (thio)sulfonates, di(thio)sulfonates, tri(thio)sulfonates; (thio)sulfonamides, di(thio)sulfonamides, tri(thio)sulfonamides; amino(thio)sulfonates,

diamino(thio)sulfonates, triamino(thio)sulfonates; imino(thio)sulfonates, diimino(thio)sulfonates; (thio)borates, di(thio)borates, (thio)boronates; organic silicates; and stibonates; and combinations thereof.

41. (Original) The corrosion-inhibiting seal of claim 1 further comprising a lubricity agent.

42. (Original) The corrosion-inhibiting seal of claim 41 wherein the lubricity agent is selected from molybdenum disulfide, fluorinated hydrocarbons, perfluorinated hydrocarbons, graphite, soft metal, and polymers, and combinations thereof.

43. (Original) The corrosion-inhibiting seal of claim 42 wherein the lubricity agent is the soft metal selected from tin, indium, and silver.

44. (Original) The corrosion-inhibiting seal of claim 1 wherein the corrosion-inhibiting seal has a color.

45. (Original) The corrosion-inhibiting seal of claim 44 further comprising an agent which improves color-fastness of the corrosion-inhibiting seal.

46. (Original) The corrosion-inhibiting seal of claim 45 wherein the agent which improves color-fastness is selected from an active UV blocker and a passive UV blocker.

47. (Original) The corrosion-inhibiting seal of claim 46 wherein the agent which improves color-fastness is the active UV blocker selected from carbon black, graphite, and phthalocyanines.

48. (Original) The corrosion-inhibiting seal of claim 46 wherein the agent which improves color-fastness is the passive UV blocker selected from titanium oxide, tin oxide, lead oxide, silicon oxide, silicates, and aluminosilicates, and combinations thereof.

49. (Original) The corrosion-inhibiting seal of claim 45 wherein the agent which

improves color-fastness is an agent which prevents smudging.

50. (Original) The corrosion-inhibiting seal of claim 49 wherein the agent which prevents smudging is selected from phosphoric acid, metaphosphates, orthophosphates, pyrophosphates, and polyphosphates, and combinations thereof.

51. (Original) The corrosion-inhibiting seal of claim 45 wherein the agent which improves color-fastness is a wetting agent.

52. (Original) The corrosion-inhibiting seal of claim 51 further comprising less than about 5 g/L of the wetting agent.

53. (Original) The corrosion-inhibiting seal of claim 51 wherein the wetting agent is a nonionic surfactant.

54-122. (Canceled).

123. (Previously Presented) The corrosion-inhibiting seal of claim 1 wherein the valence stabilizer is selected from an organic valence stabilizer.

124. (Previously Presented) A corrosion-inhibiting seal for a barrier film comprising cobalt, wherein the cobalt is trivalent cobalt, tetravalent cobalt, or combinations thereof, and a valence stabilizer combined to form a cobalt/valence stabilizer complex, wherein the valence stabilizer is selected from molybdates, tungstates, vanadates, niobates, tantalates, tellurates, periodates, iodates, carbonates, antimonates, stannates, titanates, zirconates, hafnates, bismuthates, germanates, arsenates, phosphates, borates, aluminates, and silicates, and combinations thereof, and wherein the cobalt/valence stabilizer complex has a central cavity containing a cobalt ion and an additional ion selected from B^{+3}, Al^{+3}, Si^{+4}, P^{+5}, Ti^{+4}, V^{+5}, V^{+4}, Cr^{+6}, Cr^{+3}, Mn^{+4}, Mn^{+3}, Mn^{+2}, Fe^{+3}, Fe^{+2}, Co^{+2}, Ni^{+2}, Ni^{+3}, Ni^{+4}, Cu^{+2}, Cu^{+3}, Zn^{+2}, Ga^{+3}, Ge^{+4}, As^{+5}, As^{+3}, Zr^{+4}, or Ce^{+4}.

125. (Previously Presented) A corrosion-inhibiting seal for a barrier film comprising cobalt, wherein the cobalt is trivalent cobalt, tetravalent cobalt, or combinations thereof, and a valence stabilizer combined to form a cobalt/valence stabilizer complex, wherein the valence stabilizer is an organic valence stabilizer selected from monoamines; diamines; triamines; tetraamines; pentamines; hexamines; five- or six-membered heterocyclic rings containing one to four nitrogen atoms optionally having additional nitrogen, sulfur, or oxygen binding sites; five- or six-membered heterocyclic rings containing one or two sulfur atoms and having additional nitrogen binding sites; five- or six-membered heterocyclic rings containing one or two oxygen atoms and having additional nitrogen binding sites; (two-, three-, four-, six-, eight-, or ten-)membered nitrogen, nitrogen-sulfur, or nitrogen-oxygen macrocyclics; macrocyclic oligothioketones or dithiolenes; diazenes; thio-, amido-, or imido- derivatives of hypophosphoric, phosphoric, or diphosphoric acids and salts; azo compounds, triazenes, formazans, azines, hydrazones, or Schiff Bases containing at least two azo, imine, or azine groups; azo compounds, triazenes, formazans, azines, hydrazones, or Schiff Bases with ortho- (for aryl) or alpha- or beta- (for alkyl) substitution; oximes; amidines and imido compounds; dithio ligands; amides; amino acids; N-(thio)acyl 7-aminobenzylidenimines; (thio)hydroxamates; alpha- or ortho-aminothio(di)carboxylic acids and salts; (thio)semicarbazones; (thio)acyl hydrazones; (thio)carbazones; silylaminoalcohols; thioalkyl amines and imines; hydroxyalkyl imines; (thio)aryl amines and imines; guanylureas; guanidinoureas; 2-nitrosophenols; 2-nitrophenols; N-nitrosohydroxylamines; 1,3-monothioketones; monothiomalonamides; 2-thioacylacetamides; 2-acylthioacetamides; dithiodicarbonic diamides; trithiodicarboxylic acids and salts; monothiocarbamates; monothioethers; dithioethers; trithioethers; tetrathioethers; pentathioethers; hexathioethers; disulfides; monophosphines; diphosphines; triphosphines; tetraphosphines; pentaphosphines; hexaphosphines; five- or six-membered heterocyclic rings containing one or two sulfur atoms optionally having additional sulfur, oxygen, or phosphorus binding sites; five- or six-membered heterocyclic rings containing one to three phosphorus atoms optionally having additional phosphorus, nitrogen, oxygen, or sulfur binding sites; five- or six-membered heterocyclic rings containing one to four nitrogen atoms and having additional phosphorus binding

sites; five- or six-membered heterocyclic rings containing one or two oxygen atoms and having additional sulfur or phosphorus binding sites; (five-, seven-, or nine-)membered nitrogen, nitrogen-sulfur, or nitrogen-oxygen macrocyclics; (two- to ten-)membered sulfur, sulfur-oxygen, or sulfur-phosphorus macrocyclics, not including oligothioketones or dithiolenes; (two- to ten-)membered phosphorus, nitrogen-phosphorus, or oxygen-phosphorus macrocyclics; thio-, amido-, or imido- derivatives of phosphonic and diphosphonic acids and salts containing no sulfur binding sites; amido-, or imido-derivatives of hypophosphoric, phosphoric, or diphosphoric acids and salts containing no sulfur binding sites; dithioperoxydiphosphoramides; dithioperoxydiphosphoric acids and salts; monothioperoxydiphosphoramides; monothioperoxydiphosphoric acids and salts; monothiophosphoric acids; phosphoro(dithioperoxoic) acids and salts; azo compounds, triazenes, formazans, azines, or Schiff Bases; silylamines; silazanes; guanidines and diguanidines; pyridinaldimines; hydrazones; hydramides; nitriles; thioureas and thioamides; ureas and biurets; monothio ligands; diketone ligands; dithioacyl disulfides; tetrathioperoxydicarbonic diamides; (hexa-, penta-, or tetra-)thioperoxydicarbonic acids and salts; 1,2-dithiolates; rhodanines; dithiocarbimates; (thio)xanthates; S-(alkyl- or aryl-thio)thiocarboxylic acids and salts; phosphinodithioformates; (thio)borates and (thio)boronates; (thio)arsonic acids and salts; (thio)antimonic acids and salts; phosphine and arsine sulfides or oxides; beta-hydroxyketones and –aldehydes; squaric acids and salts; carbamates and carbimates; carbazates; imidosulfurous diamides; sulfurdiimines; thiocarbonyl and mercapto oximes; 2-nitrothiophenols; 2-nitrilo(thio)phenols; acylcyanamides, imidates; 2-amidinoacetates; beta-ketoamines; 3-aminoacrylamides and 3,3-diaminoacrylamides; 3-aminoacrylic acids and salts and 3-hydroxy-3-aminoacrylic acids and salts; 2-nitroanilines; amine and diazine N-oxides; hydrazides and semicarbazides; (amino- or imino-)aryl phosphines; (thio- or hydroxy-)aryl phosphines; arsines; five- or six-membered heterocyclic rings containing one arsenic atom optionally having additional arsenic binding sites;(two- to six-)membered arsenic macrocyclics; selenoethers; five- or six-membered heterocyclic rings containing one or two selenium atoms optionally having additional selenium binding sites; (two- to six-)membered selenium macrocyclics; 1,3-diselenoketones; 1,1-diselenolates; diselenocarbamates; selenophosphoric acids and salts; selenocarbonates; cyanide, isocyanide, and cyanamide

ligands; nitrosyl and nitrite ligands; azide ligands; thiolates and selenolates; (thio)cyanate ligands; diene or bicyclic or tricyclic hydrocarbon ligands; and carbonyl, halogen, or hydroxo ligands; or combinations thereof; wherein a solubility of the cobalt/valence stabilizer complex in water is decreased by an addition of a substituent group on the organic valence stabilizer, the substituent group selected from nitro groups ($-NO_2$), perfluoroalkyl groups ($-C_xF_{2x+1}$), perchloroalkyl groups ($-C_xCl_{2x+1}$), nitramine groups ($=N-NO_2$), thioketone groups ($=C=S$), sulfenyl halide groups ($-S-X$), and sulfur dihaloimide groups ($-N=SX_2$), or combinations thereof.

126. (Previously Presented) A solid corrosion-inhibiting seal formed on a coating selected from anodic coatings, phosphating coatings, or black oxide coatings, the solid corrosion-inhibiting seal comprising cobalt, wherein the cobalt is trivalent cobalt, tetravalent cobalt, or combinations thereof, and a valence stabilizer combined to form a cobalt/valence stabilizer complex within the solid corrosion-inhibiting seal, and wherein the cobalt/valence stabilizer complex is sparingly soluble in water at about 25°C and about 760 Torr.

EVIDENCE APPENDIX

NONE

RELATED PROCEEDINGS APPENDIX

NONE

PTO/SB/17 (12-04)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($) 250.00

Complete if Known	
Application Number	10/038,150
Filing Date	January 4, 2002
First Named Inventor	Jeffrey A. Sturgill
Examiner Name	Scott R. Kastler
Art Unit	1742
Attorney Docket No.	UVD 0299 PA

METHOD OF PAYMENT (check all that apply)

☑ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): ____________

☐ Deposit Account Deposit Account Number: ____________ Deposit Account Name: ____________

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☐ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims ______ - 20 or HP = Extra Claims ______ x Fee ($) ______ = Fee Paid ($) ______

HP = highest number of total claims paid for, if greater than 20

Indep. Claims ______ - 3 or HP = Extra Claims ______ x Fee ($) ______ = Fee Paid ($) ______

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims: Fee ($) ______ Fee Paid ($) ______

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets ______ - 100 = Extra Sheets ______ / 50 = Number of each additional 50 or fraction thereof ______ (round up to a whole number) x Fee ($) ______ = Fee Paid ($) ______

4. OTHER FEE(S) Fees Paid ($)

Non-English Specification, $130 fee (no small entity discount)

Other: Brief on Appeal $250.00

SUBMITTED BY

Signature	Richard A Killworth	Registration No. (Attorney/Agent) 26,397	Telephone (937) 449-6400
Name (Print/Type)	Richard A. Killworth		Date August 29, 2006